A REVIEW PAPER ON UTILITY OF TREADMILL FOR POWER GENERATION HEAT EXCHANGER DESIGN

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ABSTRACT: In today's world global warming & other related environmental issues becomes an important matter of concern in the angle of environmental pollution. With global technological advancement energy demand is increasing and there is a strong dependence on unsustainable fossil fuels based power generation. Electricity cost is increases day by day due to insufficient power generation and increase in energy demand. Power generation from non-renewable sources have adverse effect on environment. So it is necessary to develop new ideas or processes for power generation. Due to ever increasing health consciousness and fitness the idea of building manual treadmill arises with some extra modification in the existing treadmill and with this, effort loss during exercise is also used for purpose of generation of electricity including a controller display circuit for showing parameters like timer, speed, distance, pulse rate and calories. Virtual Reality has known exponential development in the recent years, its advantages extending over a large number of other domains, like Medicine and Automation Industry. In ancient days concept of treadmill was invented for generating mechanical energy with the help of animals such as horse, dogs etc. First treadmill was introduced by Roman Empire for heavy loading like conveyer belt which we use in industries. Some of those invention required electric power for initial torque.

I. INTRODUCTION

A Treadmill is a device generally used for walking or running while staying in the same place. The concept of treadmill came into existence from olden days when animals or humans where used for running the tread-wheel for grinding grains. This concept further developed into reverse mechanism wherein the power now is used to rotate the motor accommodated on the treadmill then to rotate the belt provided, which further provide moving platform for the person who want to exercise his body to maintain in proper shape by the provision of some electrical supply directly from AC mains. Nowadays, treadmills represent systems used mainly for sports and recreational aims, like jogging, running and sprinting. Besides these basic purposes, other different domains may make use of treadmills, to help in regenerative medicine, mobility rehabilitation, human body effort limit tests and even virtual reality. Most of the people do exercise worldwide. The electricity may be produced by using manual exercise machines integrated with Electricity Generators. In this way manual power may be used to generate electricity during exercise. Different types of exercise machines are used for work out. In conventional manual treadmill human effort goes waste during the exercise. One of the most popular types of home exercise equipment is the treadmill, which provides a straight forward, efficient aerobic workout. For many, treadmills are a good choice to begin a new exercise routine because walking is well tolerated by most individuals regardless of fitness level and for most back conditions. As strength and endurance are developed, the treadmill can be used for jogging and/or for interval training. Generally, a treadmill is used for walking or running while staying in the same place. More recently, treadmills are not used to harness power, but as exercise machines for running or walking in one place. Many inventors invented treadmills with Electricity Generator. The energy that exhausted and wasted while walking or running is converted in to electrical energy. This is the latest trend in electrical power generation and it is achieved by converting human's kinetic energy. So idea is to use the power generated due to the human effort during exercise for moving motion. Energy has been always considered a vital thing for the sustenance and well-being of human being. Among them electrical energy is one of the most important blessings that science has given to mankind. Due to the pollution caused during the production of electricity with conventional sources the exploration of alternate sources of energy and its sustainable use is being highlighted nowadays. Human population all over the world and hence the energy demand is increasing day by day linearly. So harvesting power from human motions can be a feasible method. The idea of harvesting power from human locomotion is not a new concept. Over the past two decades, there has been significant interest in converting mechanical energy from human motion into electrical energy.

II. LITERATURE REVIEW

Manish Debnath et al (2015) proposed an eco-friendly method of generating electricity. They proposed the feasibility of this method for the remote areas where the electricity is beyond the reach of common people. Their suggested treadmill can be easily operated by anyone as the small connected DC generators require very small torque. Their method can reduce a significant portion of our consumption of fossil fuel, spent for generating electricity.

Shamshad Ali et al (2015) designed simple and sustainable manual treadmill with Electricity. They suggested that this manual treadmill can manage a wide range of health problems and improve strength of muscles. They emphasised that this manual treadmill with Electricity Generator can reduce Green House Gases up to some extent.

Gopinath et al (2018) proposed a technique that can produce

electricity with the assistance of electricity components that create use of the energy of human footsteps and storing of the charge by converter employed in the circuit for future applications. They suggested the need of constant increase of power to be met by putting in the systems in heavily packed places to overcome the energy crises however conjointly build up a healthy encompassing

Ravindra Burkul et al (2018) developed a branch and bound approach to optimize the 'Treadmill Electric Bicycle' serving the purpose of exercise and to reduce the use of non-renewable energy resources. They created a platform in which mechanical energy is converted into linear motion. Their proposed prototype can be a good promoted area to use the energy being wasted on treadmills in fitness centres, not only to save energy but also to create a new idea of energy distribution in electrical field which is a common need for everyone in future.

Gandhewar et al (2017) proposed a project creating a platform in which mechanical energy is converted into linear motion. Their highly fuel-saving technology based prototype was promised to utilise the energy being wasted on treadmills in fitness centres. They investigated its application as an indoor locomotive device infrastructure with large roof span i.e. malls, warehouse, open markets, large office spaces, etc.

Masuma Akter et al (2017) proposed the idea of utilizing the wastage energy from human locomotion. They investigated observed as millions of people move every day in cities, significant amount of electricity can be generated by installing feasible devices at places where public walk everyday like railway stations, shopping malls, roadways, densely populated public spots etc. Their piezoelectric system can be a practical product for capturing footstep power.

Vikas Pansare et al (2019) proposed a project that can achieve all the power requirements for basic daily household needs such as inverter battery charging for auxiliary power supply, mobile and other electronic device charging.

Abhiram et al (2017) proposed a new model of tricycle which is combination of treadmill and tricycle. They investigated that the treadmill tricycle can be used in place of regular bike at reduced initial and running cost. They suggested it as a future vehicle and it does not emit any pollutants, it is an eco-friendly vehicle.

Kunal Titare et al (2018) observed during the test run of the project that the current was obtained at some specific speed. They further calculated the current output, taken out from the motor to battery and investigated that the assembly of treadmill so obtained is free from any failure and deformation.

Harsha et al (2018) developed a treadmill based human power generator using an electromagnetic dynamo generator coupled to a manual treadmill's flywheel. They investigated that a human power treadmill generator could help reduce energy consumption significantly in the gym environment. They emphasised application of the treadmill generator for a low-cost, quick to implement, simple to operate, and low maintenance solution in isolated areas such as rural countryside or developing countries. They discussed application of the treadmill as an educational tool to give people a physical perspective on quantities in energy, helping realize the importance of energy conservation. They observed that in current era, the method of human power generation could be a solution that also helps mitigate the issue of obesity and overweight.

Stavar et al (2010) proposed the treadmill with utility to be not only in recreational or sport domains but in apparently totally different ones. Domains such as Virtual Reality, Walking Rehabilitation, Regenerative Medicine, may take the advantage of using special adapted treadmills. They described a practical application that tries to control the sense, speed and acceleration of a DC motor which has the role to actuate an adapted treadmill. The authors presented a novel concept of an adaptive treadmill control based on the user's undisturbed locomotion intention.

Herman et al (2009) proposed the idea that treadmill training in parkinson's disease is safe, feasible, and likely to be efficacious and suggest that treadmill training could play an important role for improving gait and mobility in parkinson's disease, as it does in other patient groups. Their studies established efficacy and long-term, carry over effects and directly measure the effects of TT on outcomes such as quality of life and fall risk, a major cause of morbidity and functional dependence in PD.

III. CONCLUSION

It is studied from the published papers on the manual treadmill and from all the above inventors we come to know that all the invention are steady while working and work for single purpose but in different forms of design. Till now all these invention in treadmill are used only at steady stage and by means of external drive, only for single purpose. From this we get a new idea in this field to design a model which will be mobile and provide multiple output that will include human exercise and power generation. By considering these entire factors we evolve the manual treadmill with innovative design.

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